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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/808,333 | 03/25/2004 | Kazuhito Tsukagoshi | 2870-0277PUS1 | 5434 |
| 2292 7590 07/02/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747 | | | | |
| EXAMINER | | | | |
| QUACH, TUAN N | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 2826 | | | | |
| NOTIFICATION DATE | | DELIVERY MODE | | |
| 07/02/2008 | | ELECTRONIC | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/808,333

Applicant(s)

TSUKAGOSHI ET AL.

Examiner

Tuan N. Quach

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 3-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, and 21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- Paper No(s)/Mail Date ____.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Awano in view of Webster.

Re claims 1 and 21, Awano 7,084,507 teaches device formation of wiring structure including metal and an intervening carbon nanotube where the metal, e.g., drain electrode 222, contacts the carbon nanotube, e.g., 220a and wherein the carbon nanotube in contact with the component regions in substrate 202 and wherein the semiconductor material 202/204 and the metal, e.g., 222, do not directly contact each other. The carbon nanotube thus is employed for connection to device elements as well

for interconnection therebetween. The advantages include improved reliability, good migration resistance, improved device characteristics among others. See the abstract, Fig. 19C, column 3 line 31 to column 4 line 45, column 6 lines 30-58, column 9 lines 21-36, column 17 line 13-54. Re claim 21, additionally, this corresponds to similar limitations in claim 1 with the additional recitation that the carbon nanotube comprises six-membered rings in contact with the 6-membered carbon ring of the organic material. Awano is applied as above further and teaches carbon nanotube to be six-membered rings, column 6 lines 32-34, column 24 lines 3-38. Awano as applied is not limited to silicon, or any semiconductor material (e.g., column 23 line 53, column 24 line 62) but does not explicitly recite the use of the semiconductor material in which the device component being formed to include organic semiconductor material having a 6-membered carbon.

Webster (Wiley Encyclopedia of Electrical and Electronics Engineering, John Wiley & Sons, 1999, vol. 15, pp. 419, 429-434) teach organic materials including conjugated polymers, pentacene, thiophene, which comprise 6 carbon ring, see, e.g., instant specification page 12 lines 1-11 regarding similar organic materials) as conventional semiconductor materials having semiconducting properties and high electronic conductivity that can be prepared by simple fabrication. The organic materials are further taught to be light weight, flexible, conformable and are produced by simple manufacturing technologies which make them potentially very inexpensive compared to inorganic semiconductor materials. See page 419, left column, lines 21 to last line. Further advantages of organic materials and their applications to

semiconductor devices are delineated, tunability of electronic bandgap, processability of the materials on a large scale, substantial reduction of production cost. The various organic materials including anthracene, fullerene, etc., which comprise 6 carbon membered ring, see instant specification, page 12 lines 1-11, regarding similar materials). See page 429, right column.

It would have been obvious to one skilled in the art in practicing Awano invention to have employed as the semiconductor material organic semiconductor materials including 6-membered ring taught in Webster since such use is conventional and advantageous as documented by Webster as delineated above, including organic materials having semiconducting properties and high electronic conductivity that can be prepared by simple fabrication, and include further advantages such as light weight, flexible, conformable and are produced by simple manufacturing technologies which make them potentially very inexpensive compared to inorganic semiconductor materials, tunability of electronic bandgap, processability of the materials on a large scale, substantial reduction of production cost, among others. Additionally, re claim 21, the use of carbon nanotube comprising six-membered carbon ring is conventional and obvious as evidenced by Awano above, and in the alternative, the carbon nanotube comprising such six-membered rings would have been conventional and obvious to one skilled in the art; the contact between the carbon nanotube six-membered rings and the 6-membered ring of the organic semiconductor would logically follow when the respective materials are employed and in contact. Re claim 2, intended use or application to TFTs in claim 2 would have been apparent given the

scope of the structures in Awano, which shows field effect transistors, and in any event, is unpatentable as a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness, but instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Applicant's arguments filed February 20, 2008 have been fully considered but they are not persuasive.

Applicant argues that Awano teaches contact to p doped silicon; however, Awano is not limited to silicon as the substrate material and is considered to encompass suitable substrate material and does not exclude or preclude any suitable semiconductor material including the conventional and advantageous organic material in question as evidenced by Webster. Applicant further argues that Awano uses doping of arsenic in an example. Nonetheless, reference is made to column 23 lines 52 to column 24 line 3, column 24 line 61-64 evidencing that Awano's invention is not limited to contact to p or arsenic doped silicon.

Regarding applicant's argument on the non-elected claims, the response previously provided in Paper No. 20060625, page 2 remains applicable and is repeated.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Tuan Quach whose telephone number is 571-272-1717. The examiner can normally be reached on M-F from 8:00 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Sue Purvis can be reached on 571-272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuan N. Quach/
Primary Examiner, Art Unit 2826